

REMARKS

Applicants have carefully considered this Application in connection with the Examiner's Action, and respectfully request reconsideration of this Application in view of the above Amendment and the following remarks.

Pending in this application are Claims 1 – 4, 9 – 11, and 39 – 53.

I. Rejections Under 35 U.S.C. §103(a)

Claims 1-4, 9-11, and 39-53, stand rejected under U.S.C. 103(a) as being obvious over U.S. 2002/0183207 to Hjortstam et al ("the Hjortstam Reference"), in view of U.S. 6,423,605 to Sklyarevich et al. ("the Sklyarevich Reference") or U.S. 6,203,864 to Zhang et al. ("the Zhang Reference"), in further view of U.S. 6,833,086 to Kajiwara ("the Kajiwara Reference"). The Examiner asserts that Hjortstam teaches all claim limitations except for subjecting the carbon nanotubes to microwave radiation while in an inert gas chamber or vacuum chamber. The Examiner has asserted that it would have been obvious in view of the Sklyarevich Reference or the Zhang Reference to utilize an inert gas chamber or a vacuum chamber for the microwave irradiation of the carbon nanotubes. The Examiner has further stated that the purification method of the Kajiwara Reference would have made it a matter of routine engineering expediency to purify nanotubes to greater than 90% purity. Applicants respectfully submit that the current invention would not have been obvious in view of the teachings of the cited references.

Applicants assert that the purification of nanotubes to 90% purity which results from the currently-claimed method is not, in fact, disclosed in the Kajiwara Reference, and that it is an unexpected and desirable result. The Kajiwara Reference teaches that, "an oxygen plasma treatment or a fluorine plasma treatment may be carried out" (please see column 32, line 52), which does not enable one skilled in the art to carry out a process which results in single-walled or multi-walled carbon nanotubes having greater than 90% purity. A person working in the field would lack any kind of instruction as to how to carry out an oxygen plasma treatment or a fluorine plasma treatment for this particular process.

Clearly, it would often be desirable to produce nanotubes with a higher degree of purity, and if it had been obvious to one of skill in the art how to achieve this, it would have been common practice. As has been noted in previous responses, the Hjortstam reference teaches nanotubes that contain impurities in the form of dopants and intercalants (please see the Hjortstam, Paragraph 22 and Claim 1), which shows that it was not actually common practice to produce highly-purified nanotubes.

Moreover, the Examiner is using impermissible hindsight picking and choosing in combining the cited references to allegedly arrive at the claimed invention. There are many types of nanotubes in existence, with precise parameters in the process for arriving at each type. It is not possible to say that a vague allusion to a purification method in a reference which deals primarily with one type of nanotube could be extrapolated to work with another type of nanotube. The area of nanotube production is highly experimental, and a process which works for producing another type of nanotube may not necessarily be applicable to the production of producing single-walled or multi-walled nanotubes.

It is clear, therefore, that the Kajiwara Reference does not provide sufficient enablement for altering the process of the Hjortstam Reference to produce highly-purified nanotubes, as asserted by the Examiner. For these reasons, the pending claims are patentable over Hjorstam in view or Sklyarevich or Zhang, and in further view of Kajiwara.

II. Conclusion

Applicants respectfully submit that, in light of the foregoing comments, Claims 1 – 4, 9 – 11, and 39 – 53 are in condition for allowance. A Notice of Allowance is therefore requested.

If the Examiner has any other matters which pertain to this Application, the Examiner is encouraged to contact the undersigned to resolve these matters by Examiner's Amendment where possible.

Respectfully submitted,

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